

CLAIMS

What is claimed is:

- 1 1. A multi-band infrared imaging device, comprising:
2 An uncooled microbolometer focal plane array comprising a
3 plurality of pixels, each of said pixels further comprising at least
4 one structure layer, a detector layer and a medium wave absorber
5 layer, and wherein each said pixel simultaneously detects at least
6 two IR bands.
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- 1 2. The device according to claim 1, wherein said array is fabricated
2 by LWIR processing.
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- 1 3. The device according to claim 1, wherein said bands are selected
2 from the group consisting of: MWIR/LWIR, MWIR/SWIR,
3 SWIR/LWIR, SWIR/MWIR, and SWIR/MWIR/LWIR.
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- 1 4. The device according to claim 1, wherein said structure layer is
2 selected from at least one of the group consisting of: metal films,
3 semiconductor films, and dielectrics.
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- 1 5. The device according to claim 1, wherein said medium wave
2 absorber layer is selected from at least one of the group
3 consisting of: metal films, semiconductor films, and dielectrics
4 with high MW absorption.
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- 1 6. An optical stack for an uncooled microbolometer device, comprising:
2 a read out integrated circuit (ROIC) substrate;
3 a reflector on a surface of said substrate;

4 a plurality of layers fabricated by LWIR processing, wherein
5 said plurality of layers include an MWIR absorber, a detector,
6 and at least one structure layer providing support and/or
7 isolation;
8 a gap between said reflector and said plurality of layers; and
9 wherein said stack is part of said uncooled microbolometer and
10 detects at least medium wave radiation.

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1 7. The stack according to claim 6, wherein said structure layer is
2 selected from at least one of the group consisting of: metal films,
3 semiconductor films, and dielectrics.

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5 8. The stack according to claim 6, wherein said stack further detects
6 LWIR and/or SWIR.

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1 9. The stack according to claim 6, wherein said structure layer
2 comprises at least one silicon nitride layer and at least one silicon
3 dioxide layer.

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1 10. The stack according to claim 6, wherein said detector is vanadium
2 oxide (VOx) or amorphous silicon.

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1 11. The stack according to claim 6, wherein said MWIR absorber is
2 selected from at least one member of the group consisting of:
3 metal films, semiconductor films, and dielectrics with high MW
4 absorption.

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1 12. The stack according to claim 11, wherein said MWIR absorber is
2 chrome, titanium nitride (TiN) or titanium tungsten (TiW).

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1 13. A multi-spectral infrared (IR) focal plane array, comprising:

2 an uncooled microbolometer detecting at least two infrared
3 bands, said microbolometer comprising;
4 a generally planar read out integrated circuit substrate base;
5 at least one generally planar microbridge disposed
6 approximately parallel to said base and separated by a gap; and
7 wherein each said microbridge comprises a plurality of layers,
8 said layers comprising at least one structural support layer, a
9 detector layer, and selectively a medium wave absorber layer.

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1 14. The array according to claim 13, wherein said array is selectively
2 programmable to at least one of said bands.

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1 15. The array according to claim 13, wherein said array is processed
2 by LWIR techniques.

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1 16. The array according to claim 13, wherein said at least one
2 microbridge forms a two-dimensional array having at least one
3 microbridge without said medium wave absorber layer.

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1 17. The array according to claim 13, wherein said multiple IR bands
2 are selected from the group consisting of: SWIR/MWIR,
3 SWIR/LWIR, MWIR/LWIR, and SWIR/MWIR/LWIR.

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1 18. The device according to claim 13, wherein each said microbridge
2 of said array is arranged in a pattern having at least one said
3 microbridge with said medium wave absorber and least one said
4 microbridge without said medium wave absorber.

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1 19. The array according to claim 13, wherein said medium wave
2 absorber is selectively formed by a pattern etch.

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1 20. The array according to claim 13, wherein at least one microbridge
2 of the array is optimized for one of said bands and at least one
3 microbridge of the array is optimized for a different one of said
4 bands.